

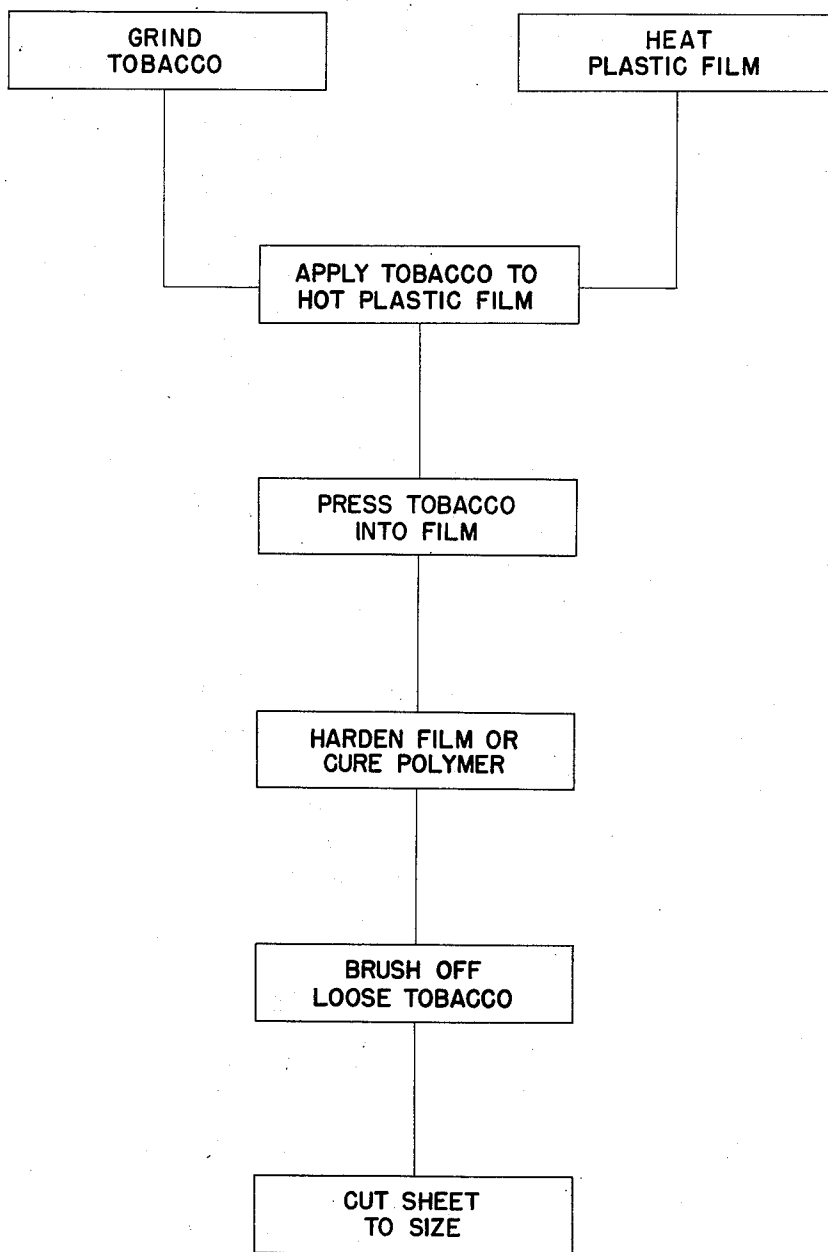
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MANUFACTURE OF TOBACCO SHEET

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MANUFACTURE OF TOBACCO SHEET

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This invention relates to the manufacture of tobacco sheet. In particular the invention concerns the combination of finely divided tobacco imbedded in thermoplastic film.

Many proposals have been made for the manufacture of tobacco sheet from finely divided tobacco. All of these methods require the treatment of adhesive material with a solvent or liquid dispersing material (such as water) which is removed from the sheet by final evaporation.

Heretofore, all methods of forming tobacco sheet by the application of tobacco material to a sticky film have relied upon the support of the film either upon the surface of rollers or on a belt at the time tobacco is applied to the film. This has generally been done because the film lacks enough tensile strength to be self-supporting prior to drying or because a sticky liquid coating on a solid base, such as paper, is inclined to flow off unless the base is supported horizontally on a large surface. In all cases drying the sheet has been a necessary operation. Coating has been limited to a sequential operation rather than coating both sides of a sticky carrier layer at once.

Therefore, it is an object of this invention to provide a method of forming tobacco sheet from a thermally softened adhesive.

It is also an object of the invention to provide a method of forming tobacco sheet by applying finely divided tobacco to a suspended self-supporting sticky film.

Another object of the invention is to provide a tobacco sheet which includes finely divided tobacco and thermally softened adhesive material.

A further object of the invention is to provide a method of forming tobacco sheet by applying tobacco powder to a suspended thermally softened film.

These and other objects are described more particularly in the following account of the invention taken together with the accompanying drawing which shows a box type flow diagram of a method of making tobacco sheet according to the invention.

According to a preferred form of the invention as shown in the drawing, adhesive material such as self-supporting thermoplastic film is formed and fused by heat into a sticky sheet. This may be done by extrusion of the plastic as between heated sheeting rollers or through a heated die. Radiant heat may also soften the film. The adhesive film may contain admixed fiber and/or tobacco material. The film is preferably made sticky by heating.

The film is preferably suspended either vertically or horizontally. The fact that it is strong and coherent enough to be suspended indicates that it is self-supporting. In a preferred form of the invention the suspension is vertical, and the film hangs from the nip or bite of sheeting rollers, which may be heated.

The advantage of suspending a film so that both surfaces are exposed is utilized by the simultaneous application of tobacco material to these surfaces, although simple application of tobacco to only one surface is also within the scope of the invention.

The sticky film can be moved when in vertical disposition in either an upward or downward direction past a tobacco application station. The sheet may also be suspended horizontally or at any angle between the vertical

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and the horizontal at the time tobacco material is applied to the surface.

Tobacco may be applied by impinging upon the film a current of dust laden hot gas or the film may be moved through a loosely packed hopper of tobacco material which may be heated. The material in the hopper is preferably in dust or powder form but may also be in paste form. Hot rollers or presses are valuable for combining the tobacco and the adhesive matrix.

The tobacco is preferably dry ground. All parts of the tobacco plant may be used. Various kinds of tobacco may be blended. However, tobacco extracts may also be used in combination with other non-tobacco material to form a tobacco type material.

Generally a very thin sheet is formed. A sheet between one and ten mils is usual but about four mils is preferable. Strength is at least that of leaf tobacco although often much greater, and tobacco content may range higher than 90%.

The adhesive may be cured and hardened, as by an included catalyst, or refrigeration. The sheet is then preferably brushed free of loose particles and cut to size.

The sheet is suitable for use in smoking articles such as cigars and cigarettes either as a shredded filler or as a wrapping sheet.

The preferred adhesive for use with tobacco in this invention is ethyl cellulose film. Various cellulose base esters and ethers and mixtures and copolymers thereof, which may be conventionally plasticized, are equally suitable. They include acetate, propionate and butyrate of cellulose.

Alkyl cellulose ethers such as ethyl cellulose are particularly suitable when 50% or more of the hydroxyl radicals of cellulose have been replaced by alkoxy groups.

Non-cellulosic thermoplastic polymers such as olefins of the polyethylene type and polyamides of the nylon type as well as vinyl and vinylidene resins such as polyvinyl alcohol are also suitable.

Although some of the non-cellulosic materials burn poorly, they are used in such relatively small amounts and may be combined with conventional burn catalysts so that the sheet will, nevertheless, burn well and undesirable odor be masked by the preponderant quantity of tobacco which is preferably over 90% by weight.

The following examples illustrate the invention in a preferred form:

Example I

A sheet of ethyl cellulose about one-half mil thick, plasticized by an approximately one-third content of ethylene glycol, was heated to about 200° C. with radiant heaters to make it very soft and sticky. The hot sheet was suspended and coated with —80 mesh tobacco dust which had preferably been heated to about 100° C. The dust was pressed into the sheet with heated rollers until the sheet was nearly saturated with tobacco. The plastic was cooled by cold air and cold rollers, and the surface was brushed to remove loose particles. The sheet was then slit to a convenient width and wound onto a core. This method is shown in the drawing. This sheet contained about 92% of tobacco material. The strength was in excess of 250 grams per inch width and extensibility was good. Sheet weight was about 2.13 grams per square foot.

Example II

Another method of forming tobacco sheet from thermoplastic film is illustrated in the batch process of clamping a sheet of 1.5 mil polyethylene film covered on both sides with a layer of —80 mesh tobacco powder between stiff metal or glass plates and heating the sandwich in an oven at about 140° C. for five minutes. The sheet was re-

moved from the oven and brushed to remove loose dust. This sheet was about 75% tobacco and had a uniform tobacco appearance. The burn odor had some wax or paraffin smell but was suitably masked by blending with leaf tobacco and flavoring material.

The invention also contemplates broadly the technique of suspending a sticky sheet to which tobacco is applied, and this aspect of the invention is not strictly limited to heat softened plastics, but includes the treatment of any sheet of good burn character by the application of tobacco while the sheet is suspended. Adhesive may be mixed with the tobacco. Such a sheet may even be a tobacco sheet material, and the material applied thereto while the sheet is suspended may be merely a tobacco extract as well as a dust. The principal feature of this part of the invention is the suspension of the film.

A sheet or portion of a sheet is deemed to be suspended according to this invention when it is supported at one or more edges with the flat surfaces of the sheet free from support. This is distinct from sheet laid upon a forming surface, such as a belt, plate or screen.

Broadly stated this invention involves two features both separately and in combination. The first feature is the use of a thermoplastic polymer as an adhesive for the manufacture of tobacco sheet. The second feature is the technique of applying tobacco material which may be either tobacco or a material derived therefrom on at least one surface of a suspended film. In combination thermally softened plastic film is suspended and tobacco material is applied to the surface of the polymer film.

What is claimed is:

1. A method of making tobacco sheet which comprises in combination the steps of suspending a self-supporting sticky polymer film and applying finely divided tobacco material to said film to form a tobacco sheet.

2. A method of making tobacco sheet which comprises in combination the steps of suspending a self-supporting sticky polymer film, applying finely divided tobacco to at least one surface of said film to form a tobacco sheet.

3. A method of making tobacco sheet which comprises in combination the steps of suspending a self-supporting sticky polymer film, applying finely divided tobacco material to at least one surface of said film and imbedding said tobacco material within a matrix of said film.

4. A method of making tobacco sheet which comprises in combination the steps of forming a self-supporting

sticky polymer film having fibers dispersed therein, suspending said film and applying finely divided tobacco to at least one surface of said film to form a tobacco sheet.

5. A method of making tobacco sheet which comprises in combination the steps of moving a suspended self-supporting sticky polymer film through finely divided tobacco material, imbedding said tobacco material within said film to form a sheet and removing loosely adhering tobacco material from said sheet.

6. A method of making tobacco sheet which comprises in combination the steps of preparing a sticky polymer film by heating said polymer beyond the softening temperature thereof, applying tobacco material to at least one sticky surface of said film, imbedding said tobacco material within said film and hardening said film to form tobacco sheet.

7. A method of making tobacco sheet which comprises in combination the steps of suspending a thermally softened, sticky polymer film, coating said film with finely divided tobacco material and hardening said film with finely divided tobacco in adhering relationship thereto.

8. A method according to claim 1 wherein the film is cellulosic.

9. A method according to claim 1 wherein the film is a polyolefin.

10. A method of making tobacco sheet which comprises in combination the steps of adhering together a layer of heat softened adhesive and a layer of finely divided tobacco and forming a sheet therefrom.

11. A method of making a smoking product which comprises in combination the steps of softening an adhesive by heating, adhering a layer of said heat softened adhesive to a layer of finely divided tobacco and cooling said adhesive.

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